

Alignment

Alignment leads the eye across a page
(or screen) and ties visual elements together.

Left-justified

Use left-justified (or flush-left) text for most blocks of text. The strong vertical element guides a reader's eye from line to line.
Ragged-right justification

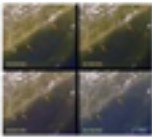



Fully justified text stretches the spaces between words to align both the left and right edges of a block of text. While it works well in wide columns (8 words per line or more), it leaves uneven word spacing in narrow columns. Poorly-designed software may exacerbate the problem.

Centered

Centered alignments are considered formal—they are commonly used for wedding invitations and the title pages of classical literature.

Right-justified

Right-justified text is often hard to read. Use it sparingly to tie captions to graphics.

<input type="checkbox"/>	2005-01-12	Earth	Earth Observing System (EOS)	Multi-angle Imaging SpectroRadiometer (MISR)	1245x1090x3
			PIA04372: Breaking Tsunami Waves along India's Eastern Coast Full Resolution: TIFF (3.174 MB) JPEG (186.1 KB)		
<input type="checkbox"/>	2005-01-12	Earth	Jason-I (TOPEX/Poseidon)	Altimeter	1590x1800x3
			PIA07219: NASA/French Satellite Data Reveal New Details of Tsunami Full Resolution: TIFF (1.269 MB) JPEG (280 KB)		
<input type="checkbox"/>	2005-01-06	Earth	Shuttle Radar Topography Mission (SRTM)	Spaceborne Imaging Radar C/X-Band Synthetic Aperture Radar	5342x1746x3
			PIA06661: Alpine Fault, New Zealand, SRTM Shaded Relief and Colored Height Full Resolution: TIFF (22.84 MB) JPEG (1.473 MB)		
<input type="checkbox"/>	2005-01-06	Earth	Shuttle Radar Topography Mission (SRTM)	Spaceborne Imaging Radar C/X-Band Synthetic Aperture Radar	2919x1565x3
			PIA06663: Davenport Ranges, Northern Territory, Australia, SRTM Shaded Relief and Colored Height Full Resolution: TIFF (18.79 MB) JPEG (688.1 KB)		

Grouping

Group like elements together.

Use **emphasis** to indicate hierarchy, **contrast** to distinguish elements from one-another, and **white-space** to separate groups. Effective grouping enables greater information density.

Headings & Labels

Visibly associate headings with their associated text or graphics.

Captions

Likewise captions. Don't strand headings, labels, subheads, captions, etc. in-between blocks of text or graphics.

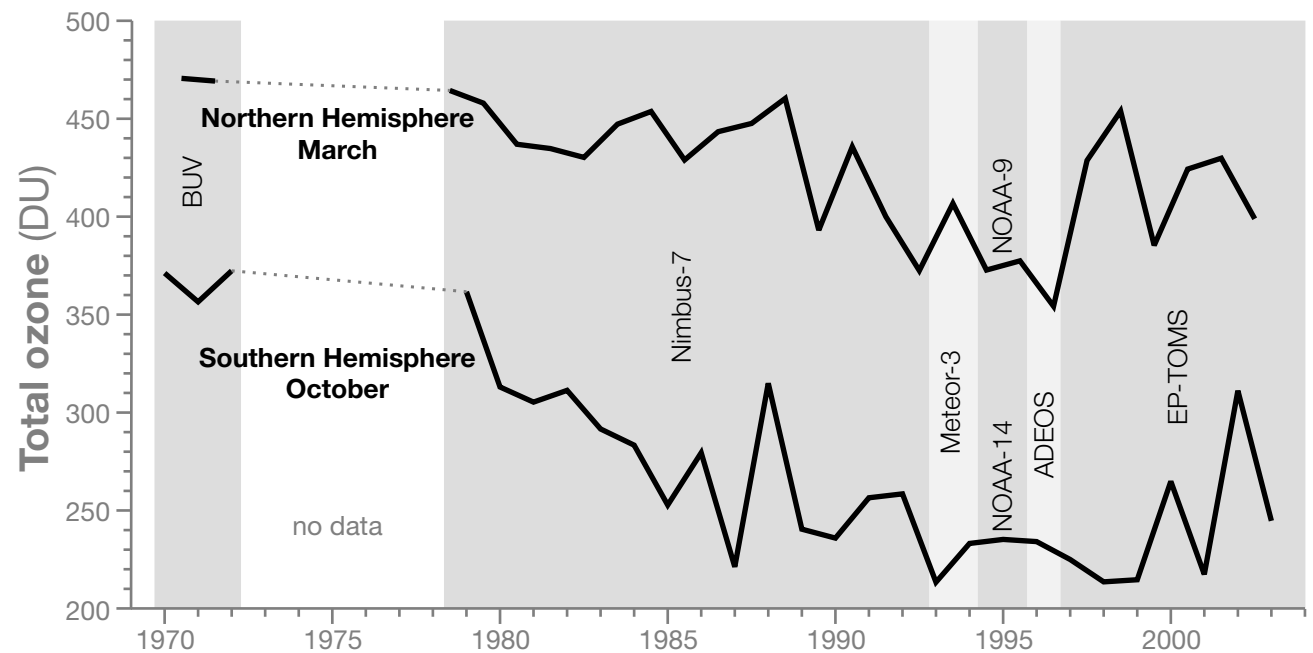
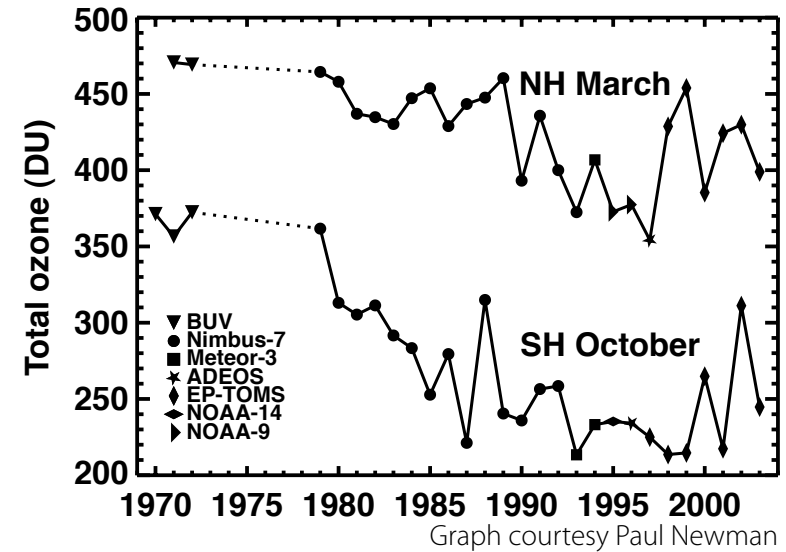


Contrast

Use contrast to form a hierarchy & layer information.

Weight, Size, color, and style are types of contrast that can be used to establish hierarchy, and distinguish elements from one another.

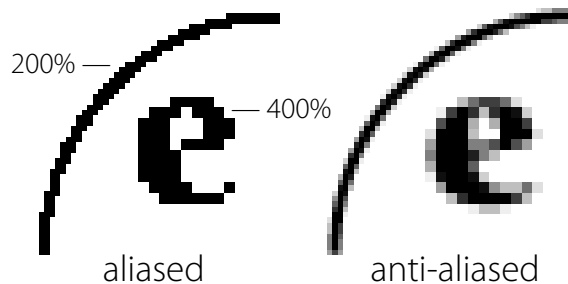
Make contrast **unambiguous.** Minor variations in **weight** or **size** can lead to confusion—this also applies to alignment and grouping.



Computer Peculiarities

Anti-aliasing and image compression

Anti-aliasing smooths the edges of curves in low-resolution media, such as computer screens.



IDL does a particularly poor job of rasterizing graphics. Possible solutions are to publish PDFs, which scale to arbitrary resolutions, or rasterize in Illustrator.

Use postscript (or PDF) illustrations for print.

Lossy compression algorithms trade file size for image quality. JPEG is optimized for photographic images, while GIF works well for text and line graphics (or images with large areas of flat color).

JPEG vs GIF

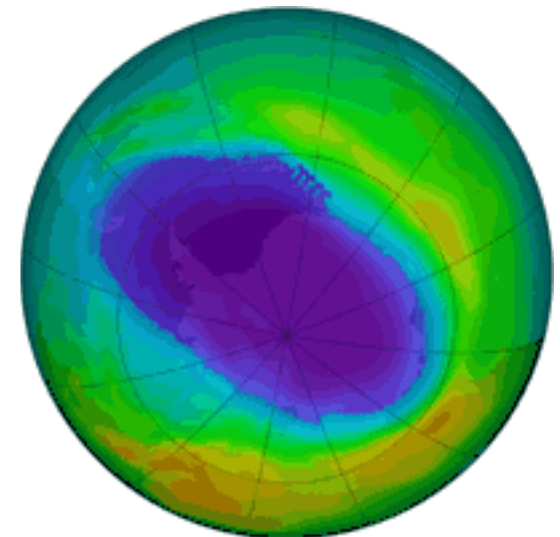
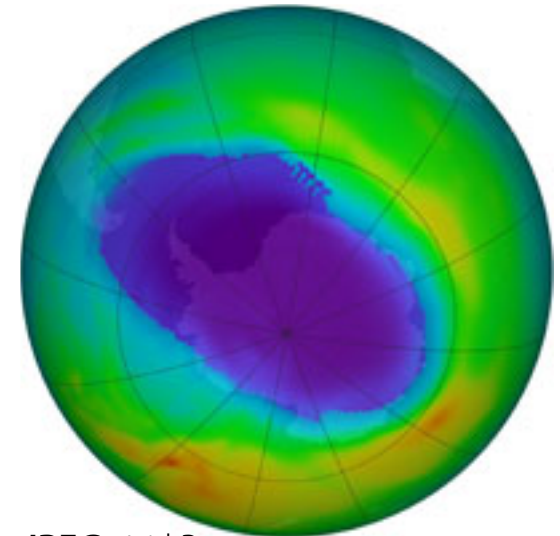
JPEG, 4.5 kB

200%

JPEG vs GIF

GIF, 0.72 kB

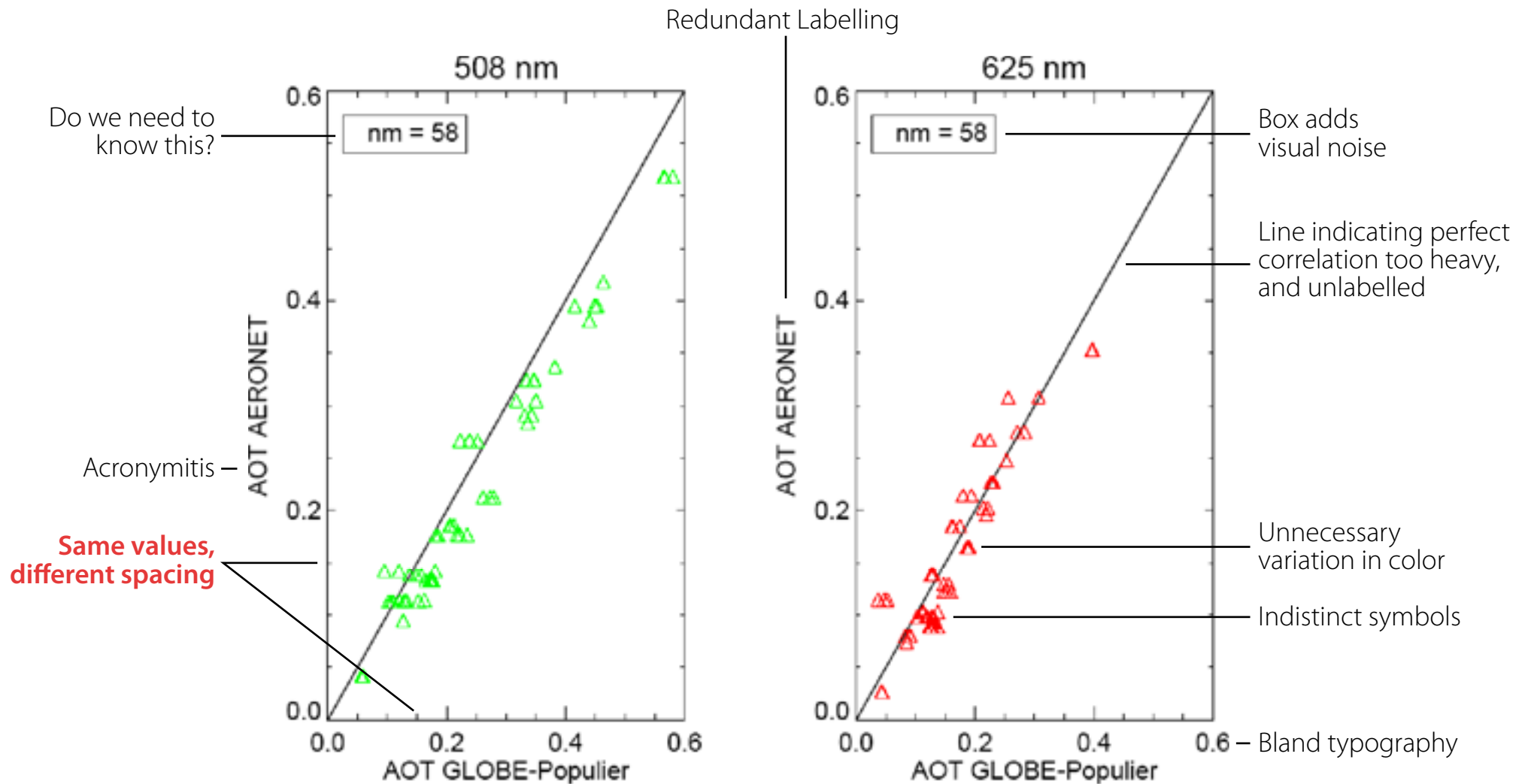
200%



GIF, 10 kB

Do No Harm

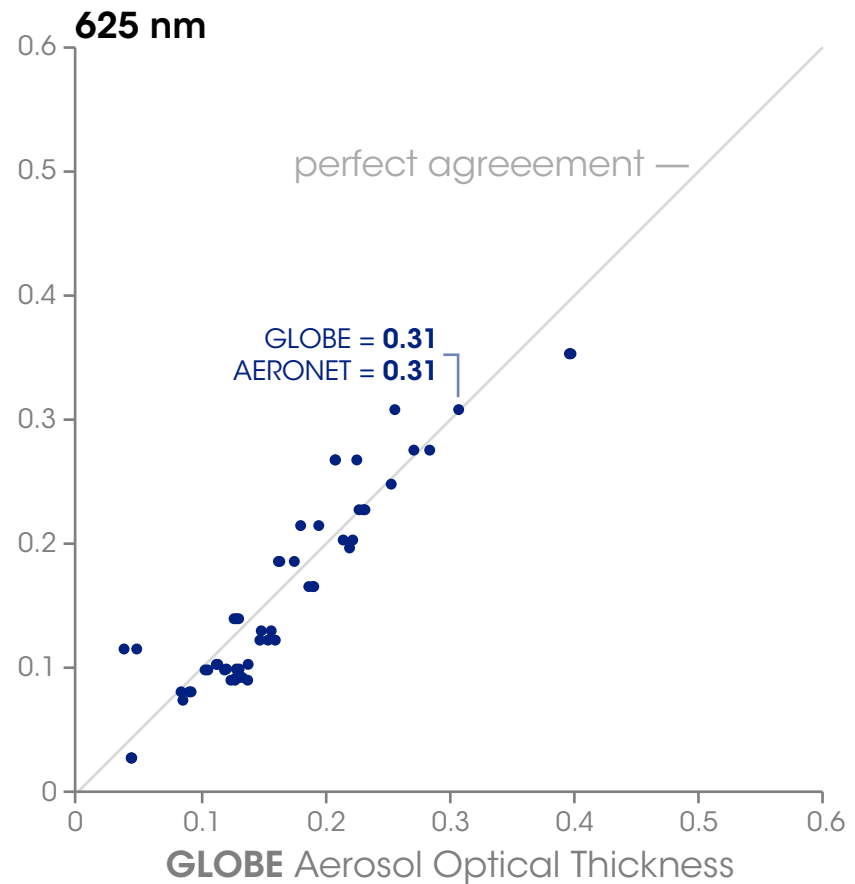
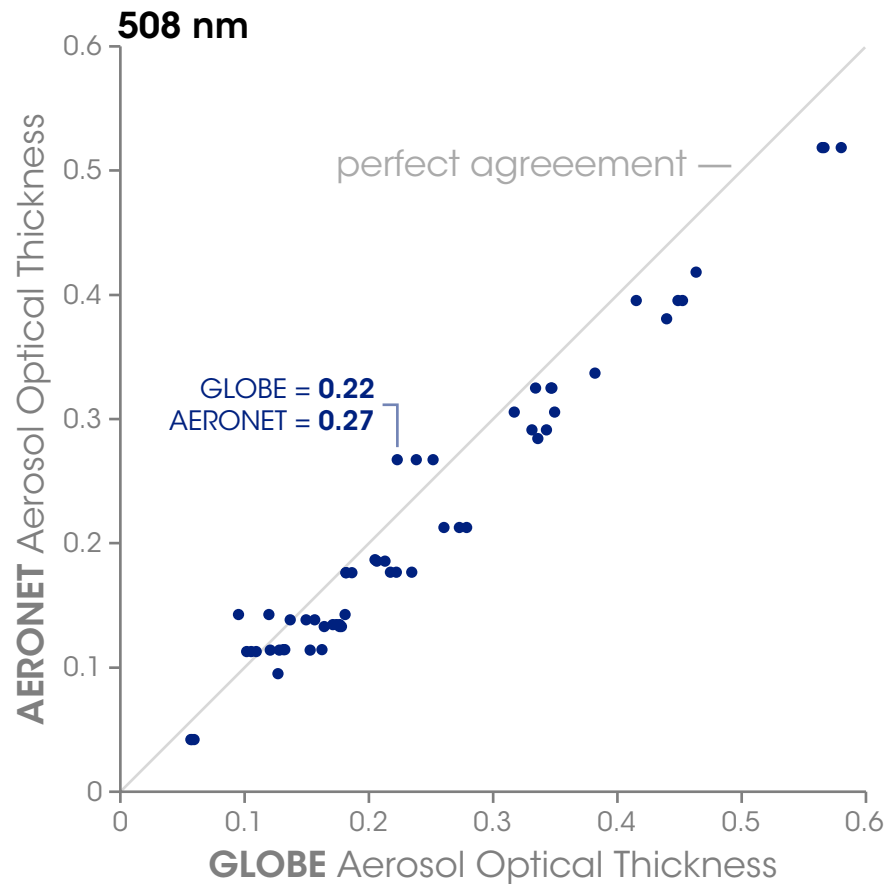
Use equal scaling for equal values.



Graphs courtesy Joris de Vroom, KNMI

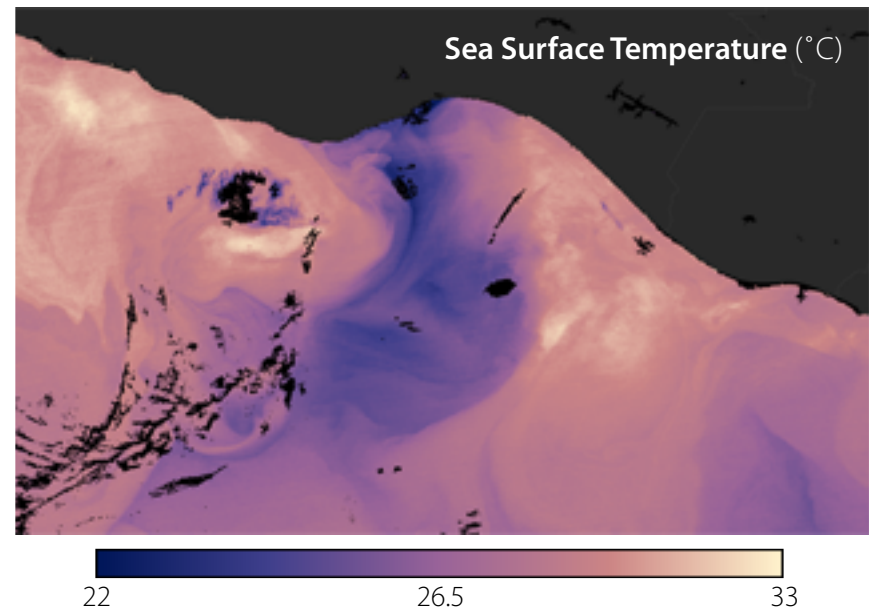
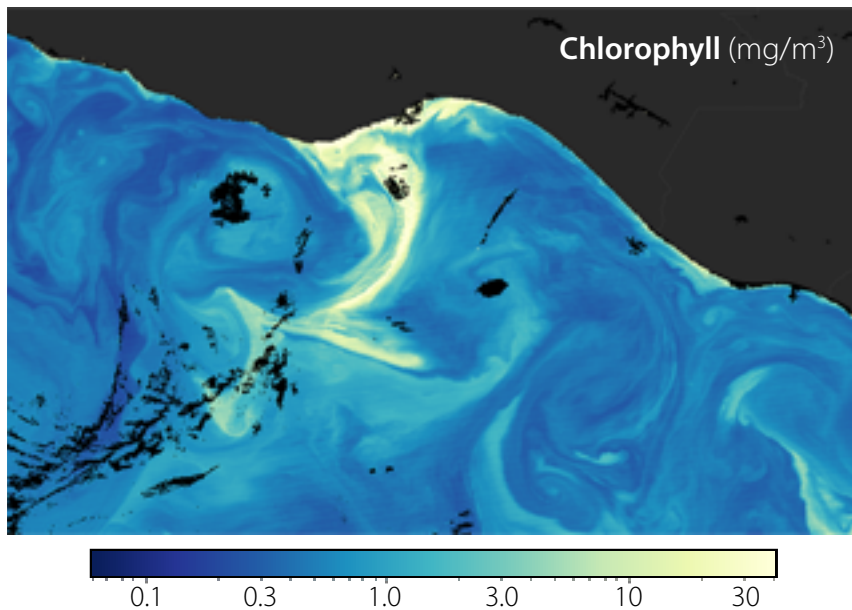
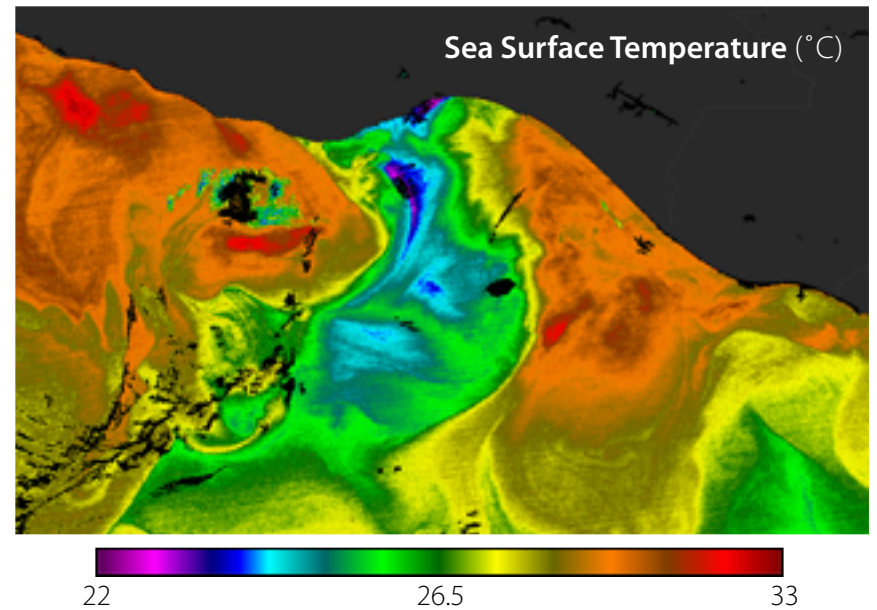
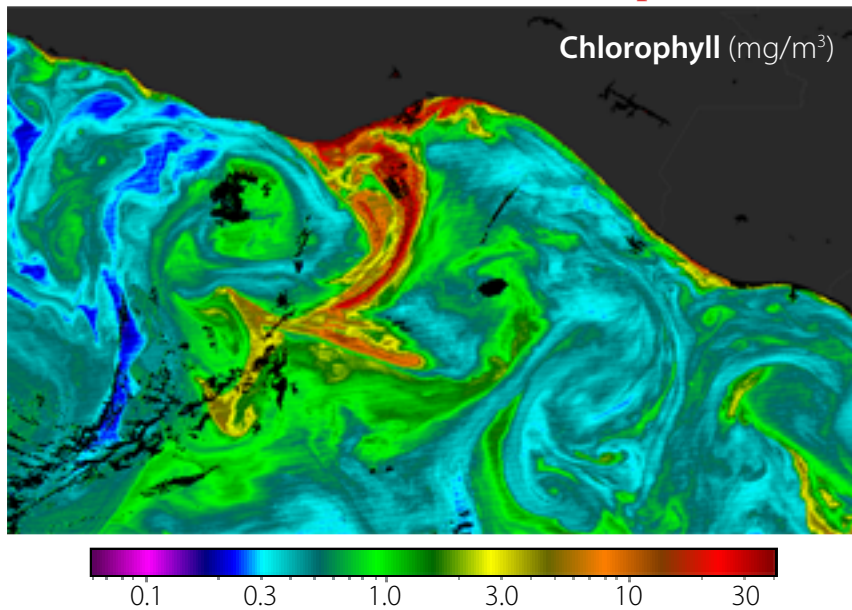
Do No Harm

Use equal scaling for equal values.



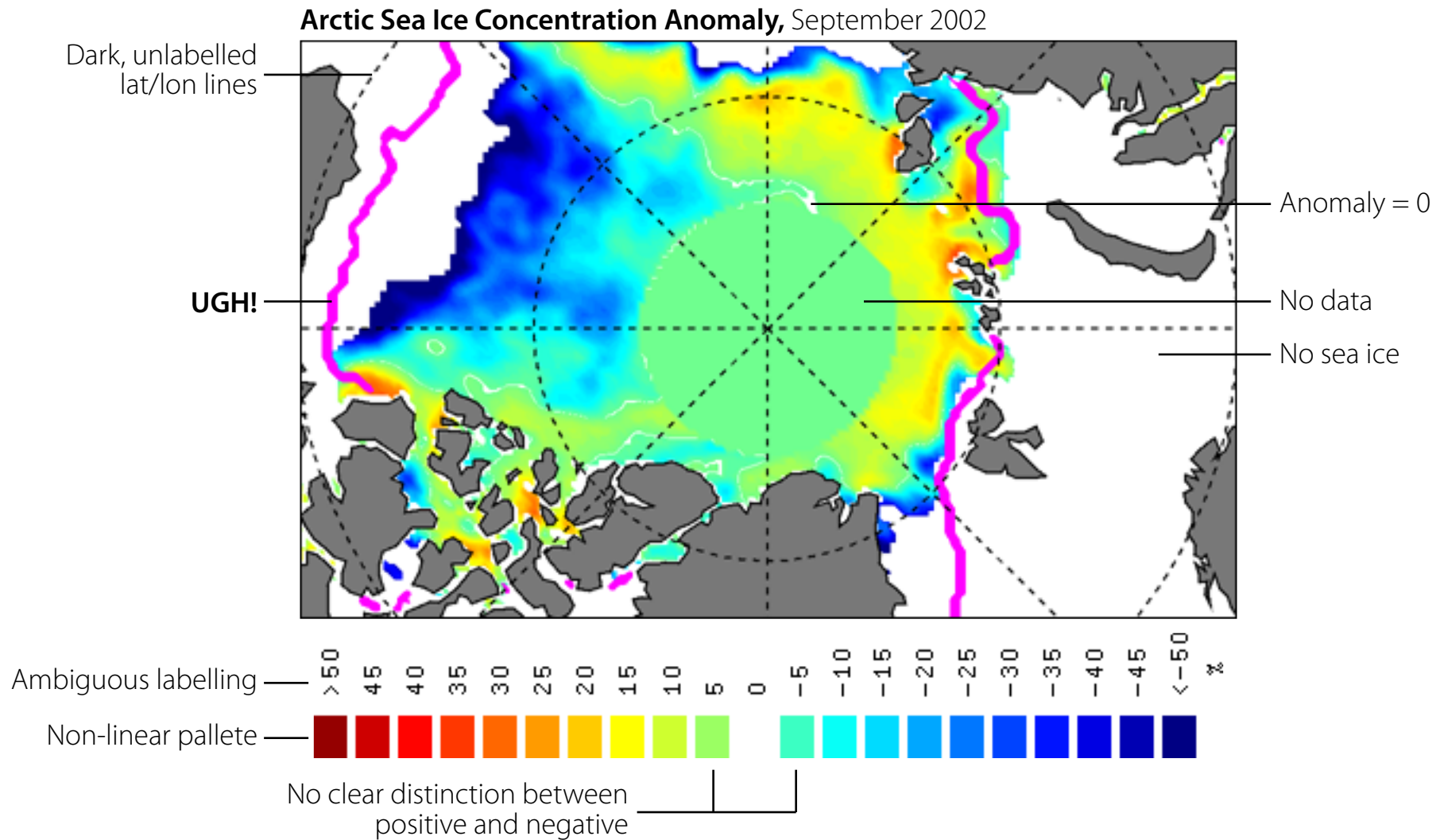
Wouldn't the changes be easier to see if both examples were on the same page?

Do No Harm Use linear color palettes.



Do No Harm

Assign unique colors for missing data & data=0



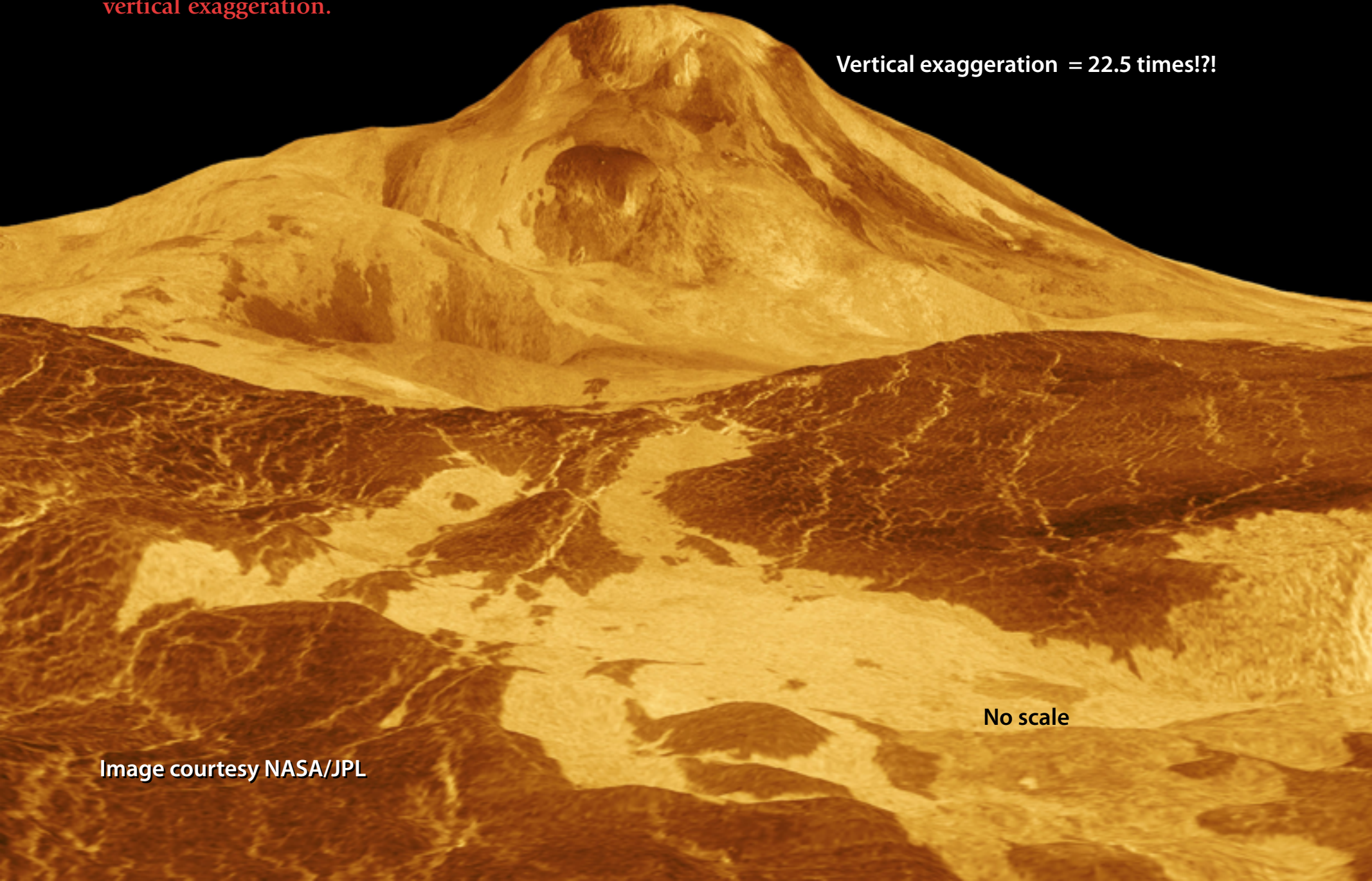
Do No Harm

Do not abuse—or even use—
vertical exaggeration.

Vertical exaggeration = 22.5 times!?!

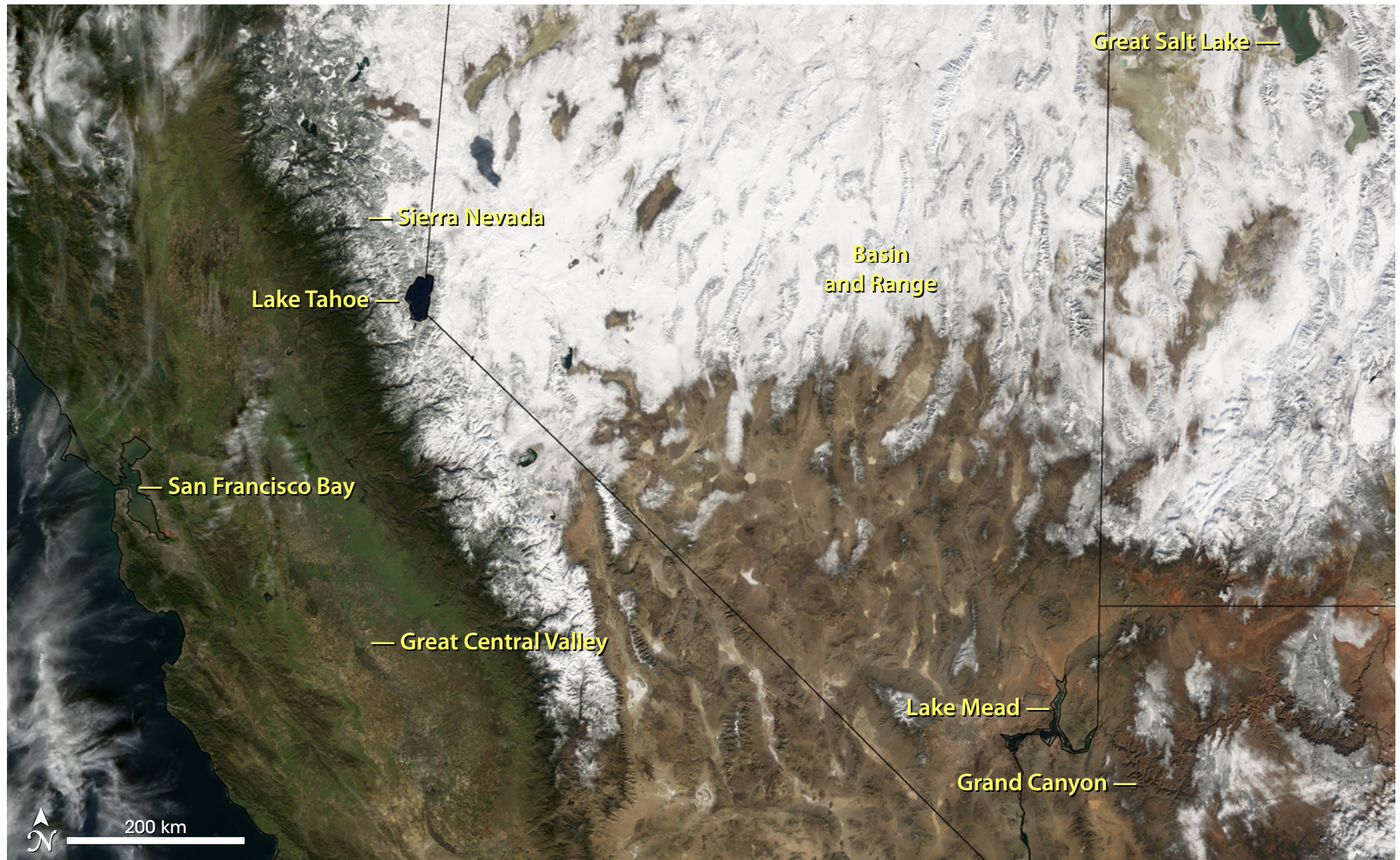
No scale

Image courtesy NASA/JPL



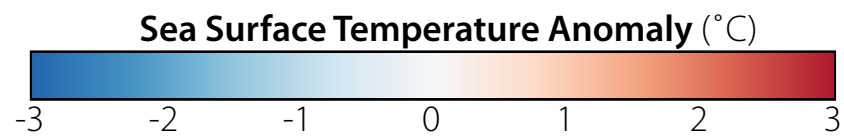
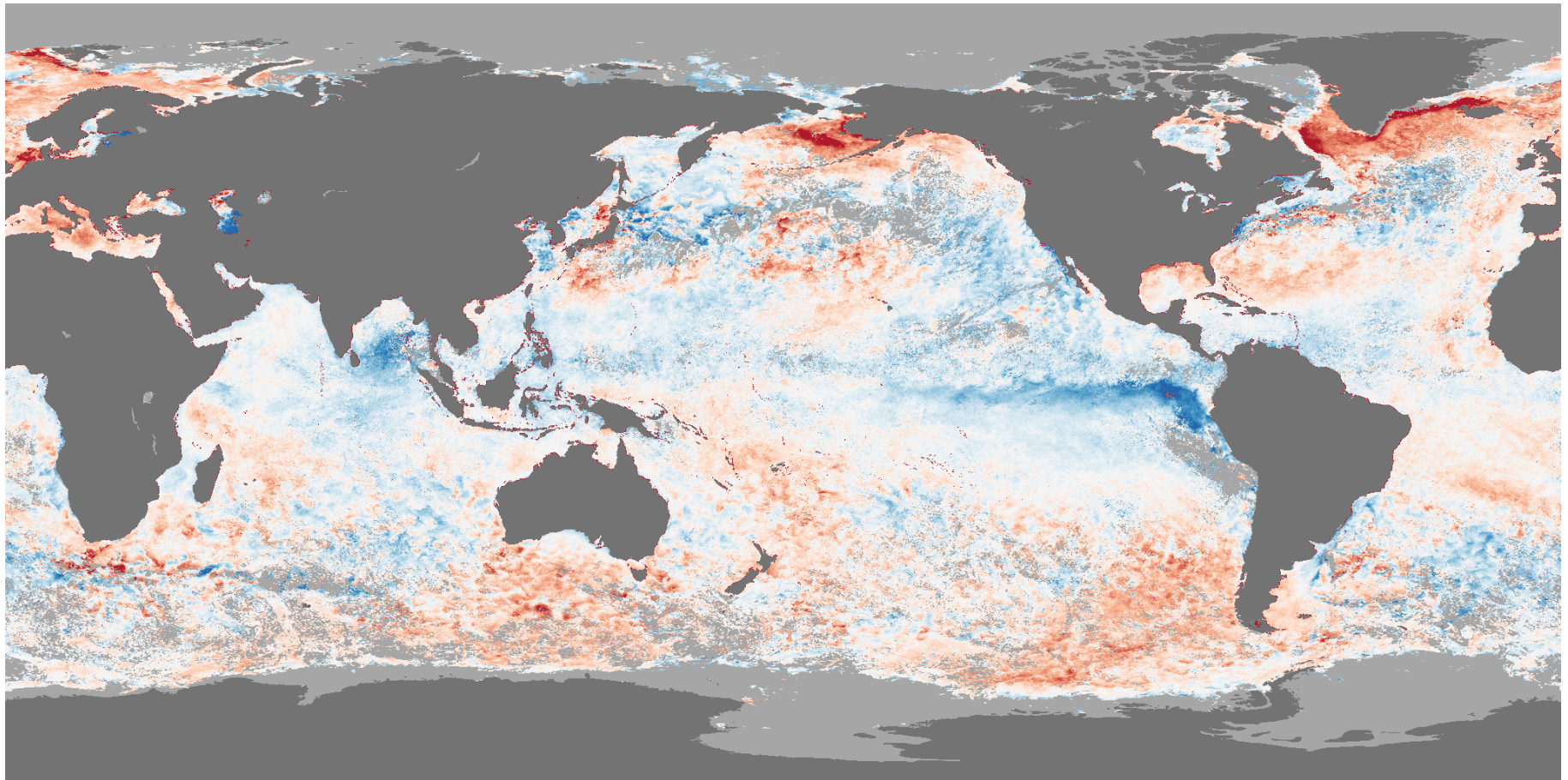
Scales and Annotations

Whenever possible, include a scale on images, and don't be afraid to annotate.



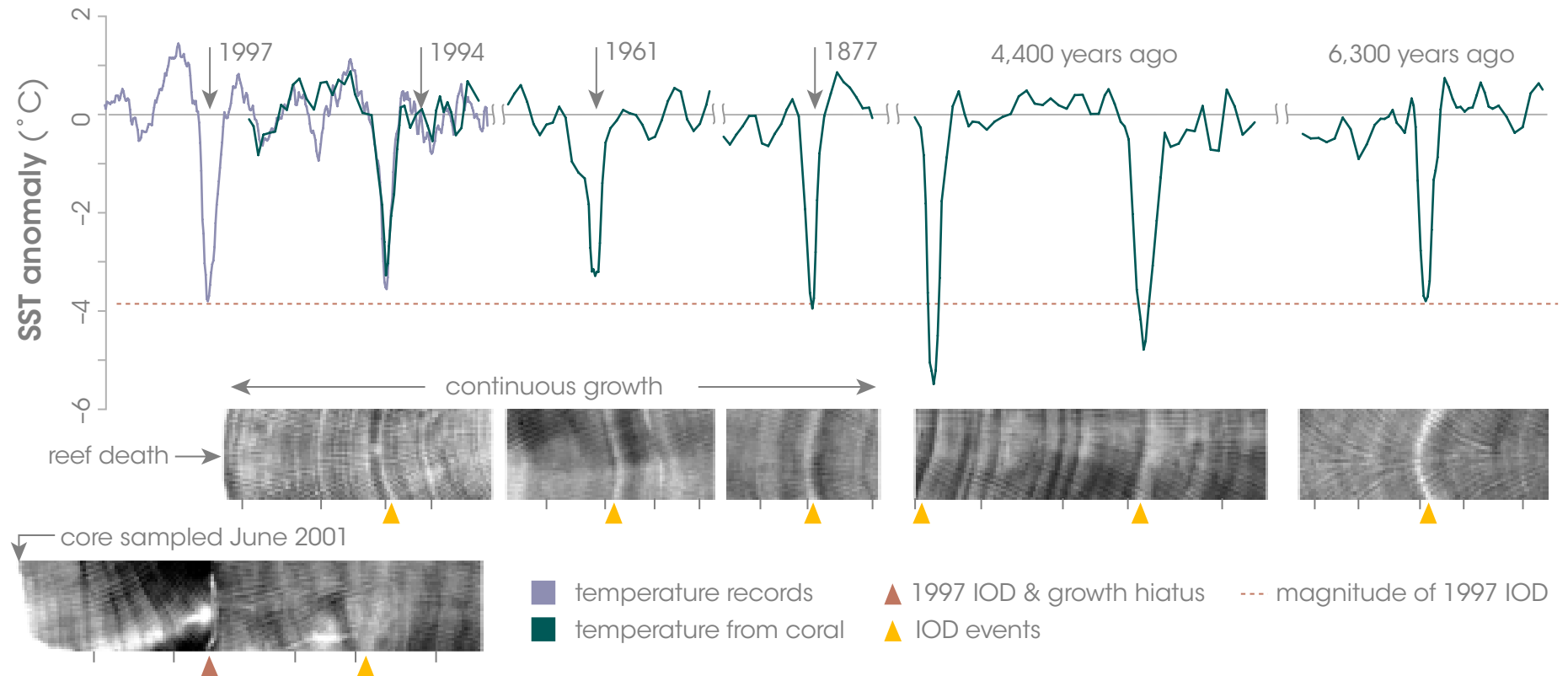
Anomaly Palettes

Plot differences and anomalies to show change



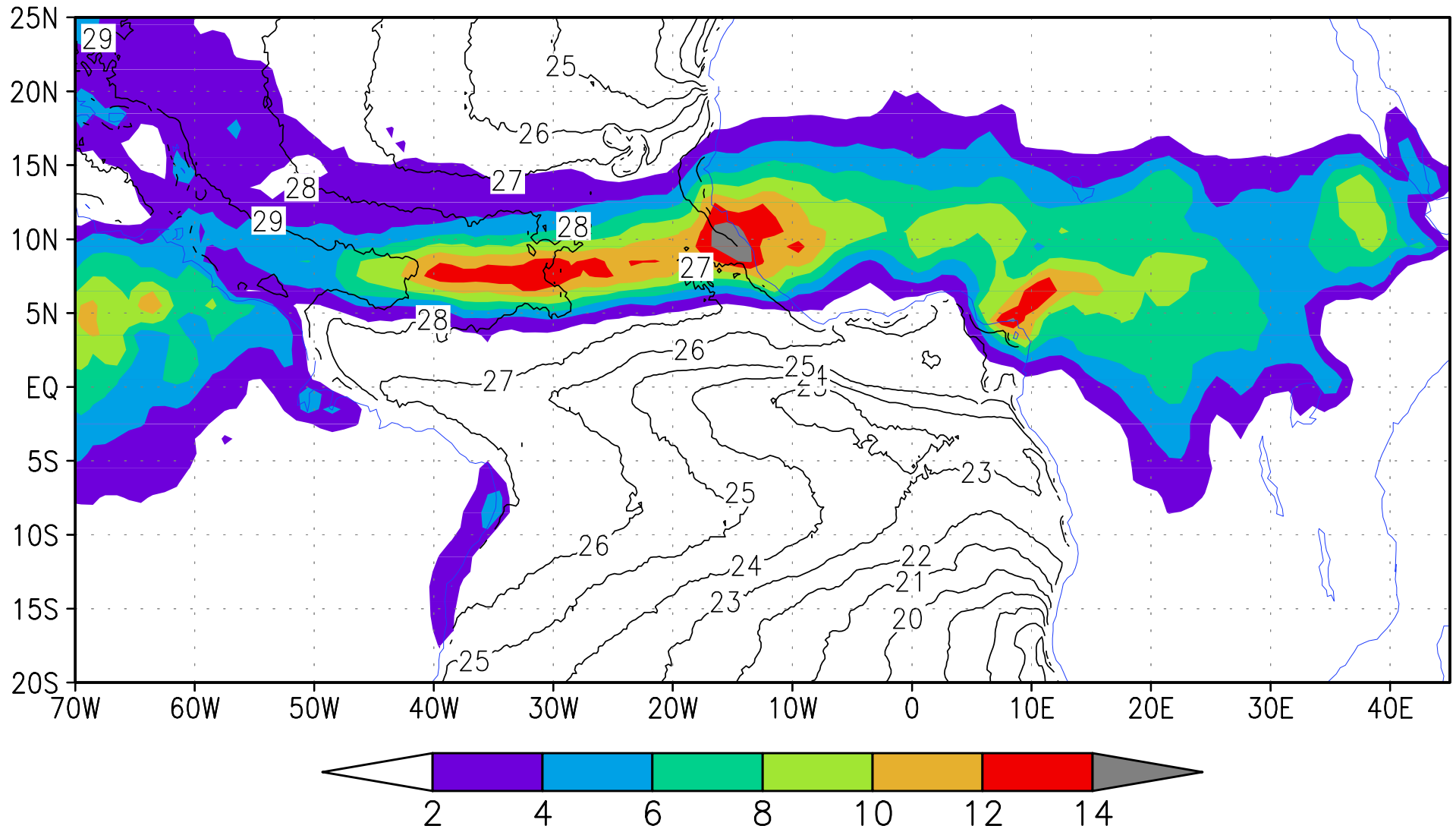
Tell a Story

Use multiple variables to show cause and effect

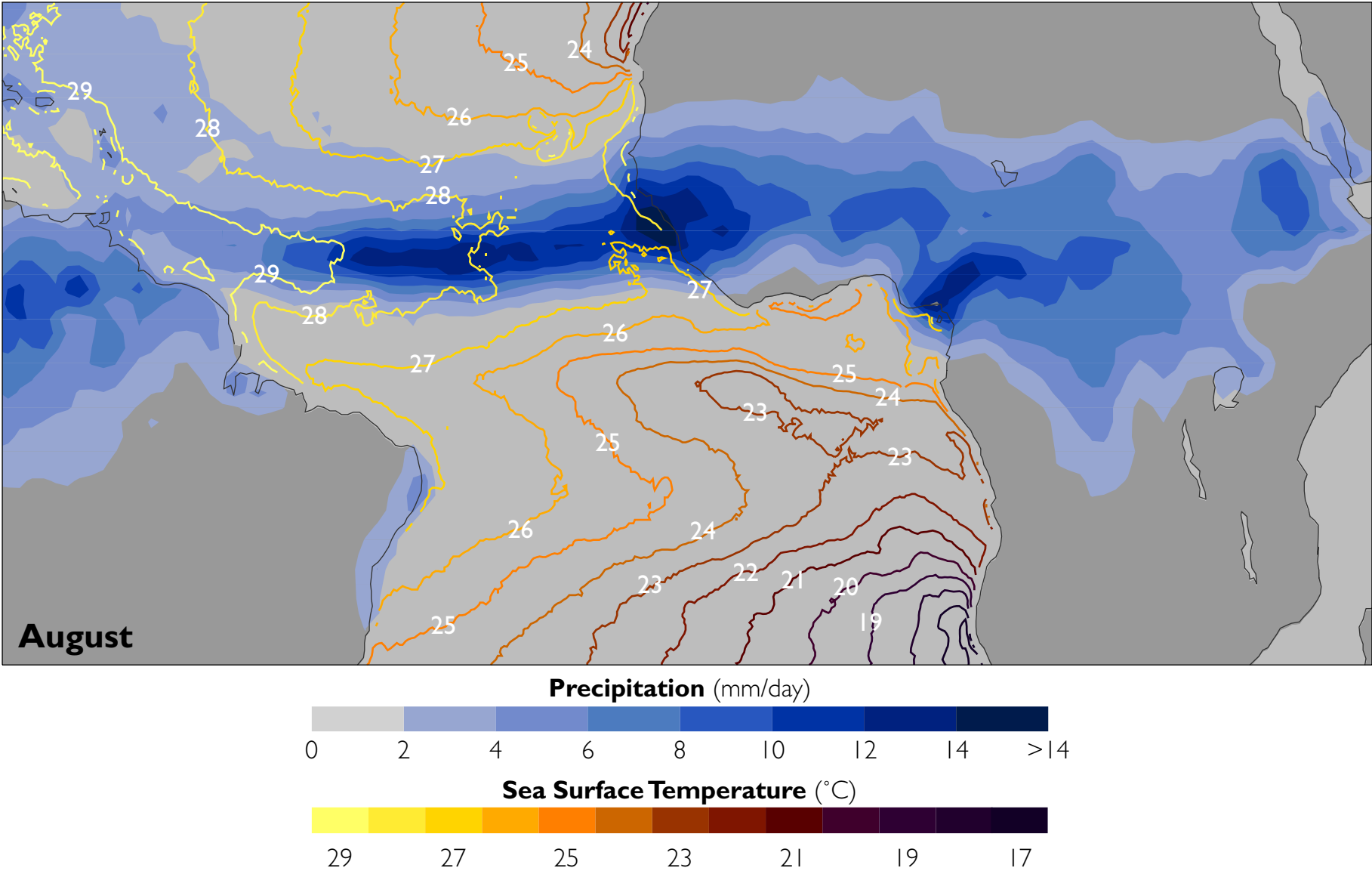


Least Effective Difference

August



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Bibliography

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William Cleveland, The Elements of Graphing Data
Edward Tufte, The Visual Display of Quantitative Information
Edward Tufte, Envisioning Information
Edward Tufte, Visual Explanations
Robin Williams, The Non-designer's Design Book

Adobe Illustrator CS Classroom in a Book
Adobe Photoshop CS Classroom in a Book

Web Sites

Color Brewer colorbrewer.org
The Work of Edward Tufte and Graphics Press www.edwardtufte.com

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